

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>B0 42354</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/NL 00/ 00084</b>	International filing date (day/month/year) <b>11/02/2000</b>	(Earliest) Priority Date (day/month/year) <b>15/02/1999</b>
Applicant <b>DE BAAT DOELMAN, Jan Pieter</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

**SYSTEM FOR TREATING FLUIDS IN AN ELECTRIC FIELD**

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐

None of the figures.

## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The abstract is modified as follows :

Line 3 : after "coil" insert "(10)" ;  
Line 4 : after "circuit" insert "(14)" ;  
Line 6 : after "sensor" insert "(18)" ;  
Line 11 : after "coil" insert "(16)".

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REC'D 19 OCT 2000

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BO 42354	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No PCT/NL00/00084	International filing date (day/month/year) 11/02/2000	Priority date (day/month/year) 15/02/1999
International Patent Classification (IPC) or national classification and IPC C02F1/48		
Applicant DE BAAT DOELMAN, Jan Pieter		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 07/09/2000	Date of completion of this report 17 10 2000
Name and mailing address of the international preliminary examining authority  European Patent Office D-80298 Munich Tel +49 89 2399 - 0 Tx 523656 epmu d Fax +49 89 2399 - 4465	Authorized officer Veronesi, S Telephone No +49 89 2399 8348 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/NL00/00084

**1. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-5 as originally filed

**Claims, No.:**

1-4 as originally filed

**Drawings, sheets:**

1/1 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description. pages:  
☐ the claims. Nos.:  
☐ the drawings. sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/NL00/00084

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims 1-4
	No: Claims
Inventive step (IS)	Yes: Claims 1-4
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-4
	No: Claims

**2. Citations and explanations**

**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

The document D1 - PATENT ABSTRACTS OF JAPAN vol. 015, no. 189 (C-0831), 15 May 1991 & JP 03 047582 A (YAMATAKE HONEYWELL CO LTD), 28 February 1991 - describes a system for treating fluids in a pipe (1), comprising field generating coils (L1, L2) mounted exteriorly of the pipe (1), an electronic circuit (2) for energizing the coils to develop an electromagnetic field in the fluid, detection means (3) for sensing a parameter - electromotive force generated in the fluid by the magnetic fields - related to the functioning of the system and for generating a parameter dependent signal and a feed back circuit for feeding back said signal to the electronic circuit to control said circuit.

EP-A-0 357 102 (DE BAAT DOELMAN) 7 March 1990 discloses a system for preventing the formation of scale in a pipe, comprising a field generating coil mounted exteriorly of the pipe, an electronic circuit for energizing the coil, a flow rate transducer for sensing the flow rate of the water in the pipe and a feed back circuit for adjusting the magnetic field generated in the pipe in function of the measured flow rate.

The claimed system is novel because the sensor comprises a field measuring coil mounted exteriorly of the pipe near the field generating coil and acting together with the measuring coil as field strength meter.

The measuring coil measures the real field developed under practical circumstances taking into account different factors, as external fields generated by electrical apparatuses, which may have an influence on the electromagnetic field in the pipe, and consequently on the treatment of the fluid, but are not predictable. The electronic circuit for energizing the coil can then be adjusted on the basis of this measure.

The available prior art does not contain any hint toward the claimed system.

The requirements of novelty and inventive step (Art. 33 PCT) appear to be

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/NL00/00084

therefore satisfied.

**Re Item VII**

**Certain defects in the international application**

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

## PCT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

13 October 2000 (13.10.00)

International application No.

PCT/NL00/00084

Applicant's or agent's file reference

BO 42354

International filing date (day/month/year)

11 February 2000 (11.02.00)

Priority date (day/month/year)

15 February 1999 (15.02.99)

Applicant

DE BAAT DOELMAN, Jan, Pieter

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

07 September 2000 (07.09.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

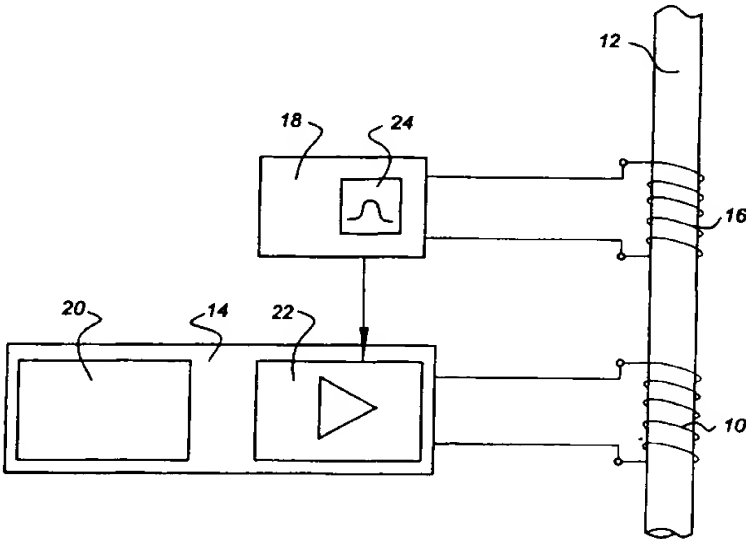
Authorized officer

Juan Cruz

Telephone No.: (41-22) 338.83.38



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b> <b>C02F 1/48</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 00/47522</b> <b>(43) International Publication Date:</b> 17 August 2000 (17.08.00)
<b>(21) International Application Number:</b> PCT/NL00/00084 <b>(22) International Filing Date:</b> 11 February 2000 (11.02.00) <b>(30) Priority Data:</b> 1011304 15 February 1999 (15.02.99) NL <b>(71)(72) Applicant and Inventor:</b> DE BAAT DOELMAN, Jan, Pieter [NL/NL]; Erasmusgracht 29/III, NL-1056 BC Amsterdam (NL). <b>(74) Agent:</b> JORRITSMA, Ruurd; Nederlandsch Octrooibureau, Scheveningseweg 82, P.O. Box 29720, NL-2502 LS The Hague (NL).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
<b>(54) Title:</b> SYSTEM FOR TREATING FLUIDS IN AN ELECTRIC FIELD   <b>(57) Abstract</b> <p>System for treating fluids, especially water, in a pipe to resist scale deposits from building up in the pipe, comprising a field generating coil (10) mounted exteriorly of the pipe, an electronic circuit (14) for energising the coil to develop an alternating electromagnetic field in the fluid, a sensor (18) for sensing a parameter related to the functioning of the system and for generating a parameter dependent signal, a feed back circuit for feeding back said parameter dependent signal to said electronic circuit to control said circuit, wherein the sensor comprises a field measuring coil (16) mounted exteriorly of said pipe near the field generating coil, the feed back circuit comprises the electronics which together with said measuring coil acts as a field strength meter.</p>		

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
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EE	Estonia	LR	Liberia	SG	Singapore		

## SYSTEM FOR TREATING FLUIDS IN AN ELECTRIC FIELD

The invention relates to a system for treating fluids, especially water, in a pipe to resist scale deposits from building up in the pipe, comprising

- 5 - a field generating coil mounted exteriorly of the pipe,
- an electronic circuit for energising the coil to develop an alternating electromagnetic field in the fluid,
- a sensor for sensing a parameter related to the functioning of the system and for generating a parameter dependent signal,
- 10 - a feed back circuit for feeding back said parameter dependent signal to said electronic circuit to control said circuit.

Systems of this type are known from the prior art. Examples are described in EP0493559, DE19502990, DE19505642

In EP0493559 a system is described wherein the sensor consists of a microphone  
15 which is connected in physical contact with the pipe. The microphone picks up any sound that is generated as a result of turbulence inside the pipe. This turbulence relates to the surface effect on water passing through the pipe as well as over obstructions such as limescale deposits. The microphone output signal controls through the feed back circuit the characteristics of the energy supplied to the field generating coil. The supplied energy  
20 is related to the flow of water passing through the pipe and to the amount of limescale already build up within the system.

A sensor embodied as an electrode positioned in the wall of the tube and in contact with the fluid is described in DE19502990. The electrode and the thereto connected measuring circuit measures the water velocity. Dependent on the measured velocity the  
25 energy supplied to the field generating coil is varied. A disadvantage of this system relies in the fact that the electrode has to be installed inside the pipe, in other words, operations on the pipe have to be performed.

A Similar construction is described in DE19505642. The sensor comprises in this case an elastic electrode carrying a number of strain gauges. Dependent on the velocity of  
30 the fluid in the pipe the strain gauge signal varies and therewith the amount of power supplied to the field generating coil varies.

A general problem in all these prior art apparatuses is the calibration of the apparatus once it is installed. The influence of the field generated by the field generating

coil is dependent on the induction in the fluid. This induction is dependent on en large number of different factors such as:

- electrical properties of the fluid. e.g. the electrical conductivity, the higher the conductivity the lower the induction,
- 5 - the dimensions and the material of the pipe,
- the influence of external fields generated e.g. by nearby electrical apparatuses such as washing machines, dryers, ironing apparatuses, pumps, etc.

Most of these factors are not predictable, or at least not accurate enough.

The aim of the invention is now to provide an apparatus of the above-mentioned  
10 type which is embodied such that the influence of all these factors is taken into account.

In agreement with this object the invention now provides an apparatus as defined in the first paragraph of this specification, which is characterised in that

- the sensor comprises a field measuring coil mounted exteriorly of said pipe near the field generating coil,
- 15 - the feed back circuit comprises the electronics which together with said measuring coil acts as a field strength meter.

By measuring the real field developed under practical circumstances information is obtained on the basis of which the electronic circuit for energising the coil to develop an electromagnetic field in the fluid can be adjusted such that even under varying  
20 circumstances the proper field strength is generated

The field measuring coil can be positioned at various locations, such as around the field generating coil. This position however has the disadvantage that the configuration within the field generating coil is not identical toe the configuration within the field measuring coil. Therefor it is preferred that the measuring coil is positioned alongside the  
25 field generating coil with no or small intermediate distance.

It is preferred to use a feedback circuit in the same manner as in the above described prior art. In other words it is preferred that the electronic circuit for energising the coil comprises an amplifier and a signal generator, whereby the amplification value is adjusted dependent on the signal from the field strength meter.

30 The invention will be explained in more detail with reference to the attached drawings.

Figure 1 illustrates a general schematical layout of a system according to the invention.

Figure 2 illustrates another embodiment of the combined coils.

Figure 3 illustrates another shape of the field generating coil.

The system as illustrated in figure 1 comprises a field generating coil 10 mounted exteriorly of the pipe 12. The pipe 12 forms the flow path for a fluid which could be water, but also any other fluid, having the tendency to deposit limescale on the inner wall of the tube 12. The coil 10 is energised by an electronic circuit 14, such that a predetermined electromagnetic field is developed within the fluid inside the pipe 12. The effect thereof is that the depositing of limescale is prevented or even counteracted. Details of this whole process can be derived from the various prior art publications and other publications which are readily available to the expert in this field.

In agreement with the invention the system comprises furthermore a field measuring coil 16 which is preferably installed around the same pipe 12 alongside the field generating coil 10 at no or short distance from said coil 10. The measuring coil 16 is connected to field strength measuring electronics 18 such that in fact the coil 16 in combination with the electronics 18 forms a field strength meter. Such field strength meters are in general known for various purposes and therefore a detailed information thereof is considered superfluous.

To obtain a proper feedback circuit between the field strength meter electronics 18 and the field generating electronics 14 it is preferred that the electronic circuit 14 comprises a signal generator 20 and a variable amplifier 22. The signal generator 20 generates a signal of the required shape and frequency and the amplifier 22 takes care that the amplitude of this signal is at the correct value for energising the coil 10 in such a manner that a field of the required strength is developed inside the tube 12.

If there were no other fields or no other external influences the system comprising the coil 10 and the electronics 14 could be calibrated once and would then function properly. However, under practical circumstances one has to reckon with various different external influences. First of all the dimensions of the tube 12 are not always the same. The diameter of the tube may vary (in The Netherlands standard diameters of 9, 12, 15, 18, and 22 mm are used for domestic waterpipes) and furthermore the thickness of the wall of the tube is not always the same and may vary dependent on the quality and the maker of the tube 12. For industrial purposes pipe sizes will vary mainly from 22 mm to 1000 mm.

Further external influences are for instance the electromagnetical fields generated by domestic appliances, such as washing machines, driers, ironing irons, etc. Under

industrial circumstances one has to reckon with electromagnetical fields generated by pumps, electric motors, transformers, high voltage cables, etc.

To cope with these external influences the actual field generated at each moment is measured by the combination of coil 16 and field strength electronics 18. The electronics circuit 18 now delivers a signal to the amplifier 22 by means of which the amplification value of the amplifier 22 is adapted such that even in the presence of  
5 varying external fields always an electromagnetical field of the required properties is developed inside the tube 12.

It is preferred that the coil 16 is positioned alongside the generating coil 10. One  
10 could imagine a situation whereby the coil 16 is installed around the coil 10. In that case, however, the inner space within the coil 10 is filled by the tube 12 and the therethrough flowing fluid whereas the inner space within the coil 16 is filled with not only the tube 12 and the therethrough flowing fluid, but also with the windings of the coil 10. In other words, the measuring circumstances are not equal to the generating circumstances.  
15 Therefore, a position of the coil 16 alongside the coil 10 is preferred.

An alternative could be embodying the coil 10 with windings which have some intermediate distance whereby the windings of the coil 16 are positioned inside said intermediate gaps. In that case exactly the generated field is measured. The disadvantage, however, is the rather complicated coil construction. A practical example of this  
20 embodiment is illustrated in figure 2. The field generating coil is indicated by 10' and the measuring coil is indicated by 16'. The coils are positioned around a pipe 12'.

In the embodiments of figure 1 and figure 2 the field generating coil produces a field parallel to the direction of the fluid flow in the pipe. It is possible to embody the coils such that the direction of the field is perpendicular to the flow direction. Figure 3  
25 illustrates an embodiment whereby the field generating coil is divided into two sections, one of which, section 26, is positioned on an arbitrary side of the pipe 30 and the other section, 26', which is not visible in the figure, is positioned on the opposite wall of the pipe 30. The coil 26 has the terminals 26a and 26b. Inside the coil section 26 the measuring coil 28 is positioned. The coil 28 has the terminals 28a and 28b. Also coil 28  
30 could comprise two sections, a section on the visible surface of the pipe 30 and another section at the opposite, non-visible side of the pipe 30.

In general the field, generated by the field generating coil, is an alternating field with a frequency higher than 1 kHz and smaller than 100 kHz. To eliminate the influence

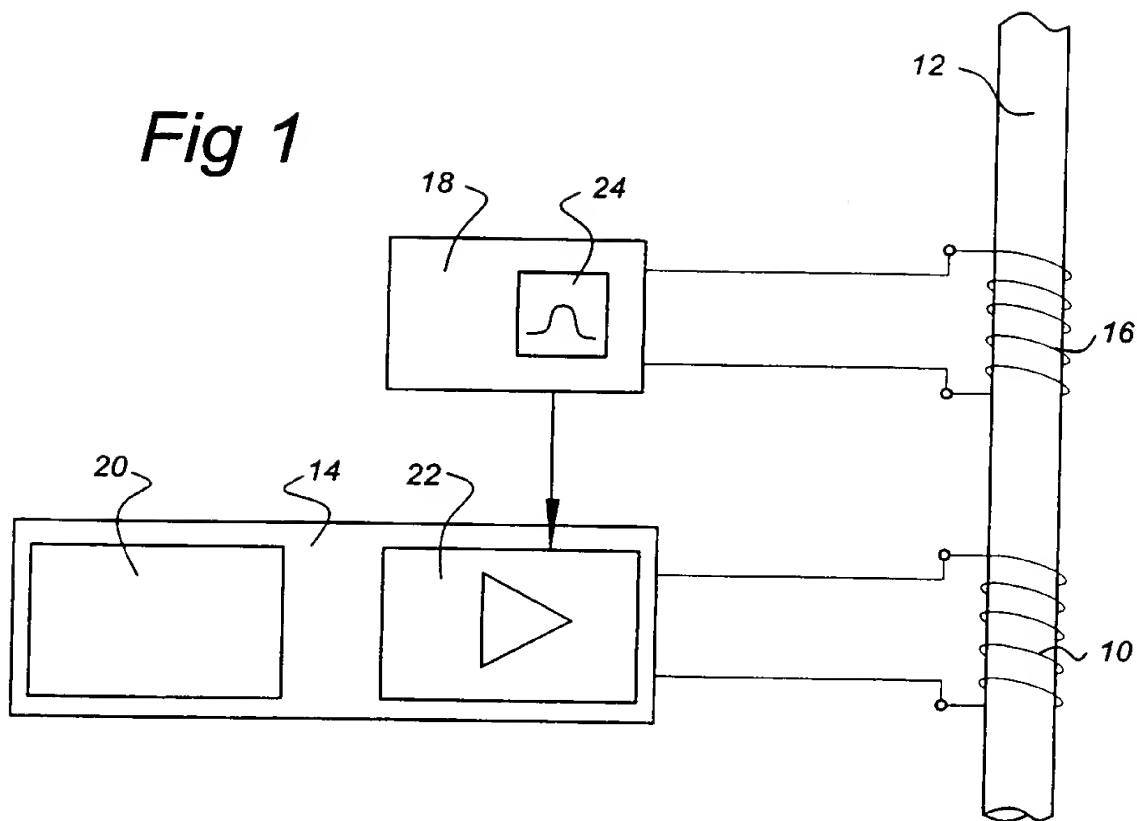
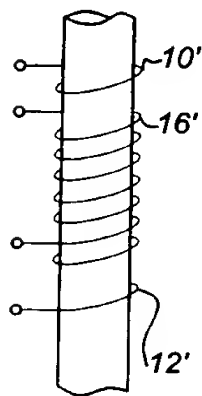
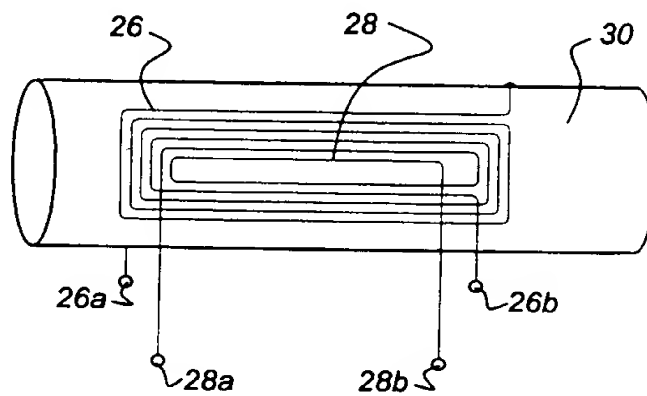
of any fields outside this range it is preferred that the electronics circuit 18 comprises a band pass filter 24 for filtering out too low and too high frequencies. The upper and lower limit of the band pass filter 24 eventually can be adjustable.

## Claims

1. System for treating fluids, especially water, in a pipe to resist scale deposits from building up in the pipe, comprising
  - 5 - a field generating coil mounted exteriorly of the pipe,
  - an electronic circuit for energising the coil to develop an alternating electromagnetic field in the fluid,
  - a sensor for sensing a parameter related to the functioning of the system and for generating a parameter dependent signal,
  - 10 - a feed back circuit for feeding back said parameter dependent signal to said electronic circuit to control said circuit,
  - characterised in that
  - the sensor comprises a field measuring coil mounted exteriorly of said pipe near the field generating coil,
  - 15 - the feed back circuit comprises the electronics which together with said measuring coil acts as a field strength meter.
2. System according to claim 1, characterised in that, the measuring coil is positioned alongside the field generating coil with no or small intermediate distance.
- 20 3. System according to claim 1 or 2, characterised in that the electronic circuit for energising the coil comprises an amplifier and a signal generator, whereby the amplification value is adjusted dependent on the signal from the field strength meter.
- 25 4. System according to one of the preceding claims, characterized in that the feedback circuit comprises a band pass filter.



1/1

*Fig 1**Fig 2**Fig 3*

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NL 00/00084

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 C02F1/48

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C02F F02M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 171 431 A (SCHULTE) 15 December 1992 (1992-12-15) the whole document ---	1-4
A	EP 0 357 102 A (DE BAAT DOELMAN) 7 March 1990 (1990-03-07) the whole document ---	1-4
A	US 5 106 491 A (SCHULZE ET AL) 21 April 1992 (1992-04-21) column 9, line 65 -column 10, line 48; figures 9,10 ---	1-4
A	US 4 755 288 A (MITCHELL DECEASED ET AL) 5 July 1988 (1988-07-05) the whole document ---	1-4
	--- -/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

23 May 2000

Date of mailing of the international search report

05/06/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
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Fax: (+31-70) 340-3016

Authorized officer

Gruber, M

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NL 00/00084

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PATENT ABSTRACTS OF JAPAN vol. 015, no. 189 (C-0831), 15 May 1991 (1991-05-15) &amp; JP 03 047582 A (YAMATAKE HONEYWELL CO LTD), 28 February 1991 (1991-02-28) abstract; figure -----</p>	1-4

# INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/NL 00/00084

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5171431	A	15-12-1992	EP 0460248 A	11-12-1991
			AT 101382 T	15-02-1994
			DE 59004562 D	24-03-1994
EP 0357102	A	07-03-1990	NL 8802179 A	02-04-1990
			AT 108169 T	15-07-1994
			CA 1337060 A	19-09-1995
			DE 68916598 D	11-08-1994
			DE 68916598 T	12-01-1995
			ES 2060742 T	01-12-1994
			US 5074998 A	24-12-1991
US 5106491	A	21-04-1992	AT 93819 T	15-09-1993
			AT 120722 T	15-04-1995
			CA 2020153 A,C	05-01-1991
			DE 4019630 A	17-01-1991
			DE 4026542 A	17-01-1991
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